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Chuang

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(54) **ADJUSTING STRUCTURE OF ELLIPTICAL TRAINER**

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A63B 23/04 (2006.01)

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CPC ***A63B 22/0015*** (2013.01); ***A63B 22/0664*** (2013.01); ***A63B 23/04*** (2013.01); *A63B 2022/067* (2013.01)

(58) **Field of Classification Search**
CPC A63B 22/0664; A63B 22/0605; A63B 22/06; A63B 2022/067; A63B 2022/0676; A63B 2022/0682; A63B 2022/0688; A63B 2022/0611; A63B 2022/0635; A63B 2022/0694; A63B 23/04
See application file for complete search history.

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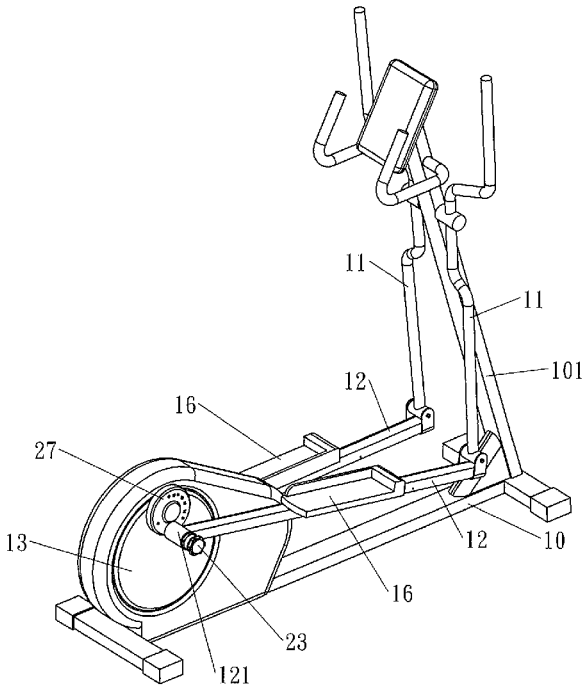
(57) **ABSTRACT**

An adjusting structure of an elliptical trainer contains: a base including an upright column, two rotatable posts rotatably connected with the upright column, two driving rods rotatably coupled with the two rotatable posts, a rotating device mounted on the base, and two shafts fixed on two side surfaces of the rotating device. Each shaft is in connection with an adjuster which has a fixing disc, an adjustment disc, and a positioning element. The fixing disc has a plurality of first orifices and a plurality of limiting stems. The adjustment disc has two opposite arcuate slots, a first hole, and a hollow tube. The positioning element is inserted into one of the plurality of first orifices via the hollow tube and the first hole, a hollow fitting sleeve is fitted with the hollow tube, and the hollow fitting sleeve is fitted with each driving rod.

9 Claims, 14 Drawing Sheets



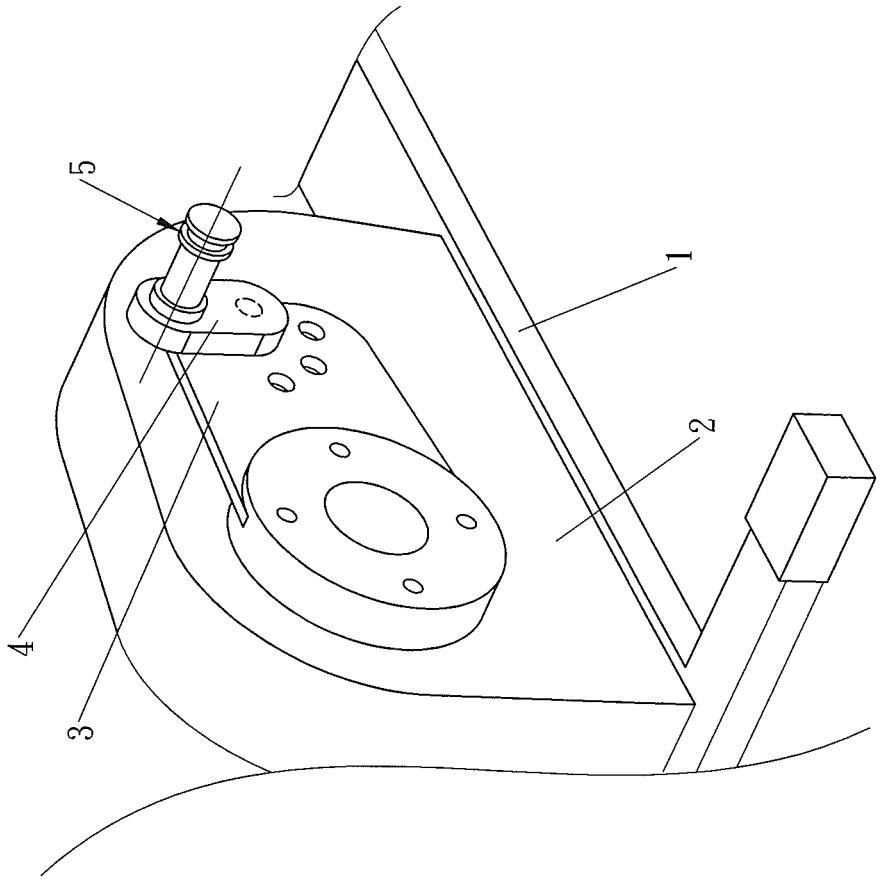


FIG. 1
PRIOR ART

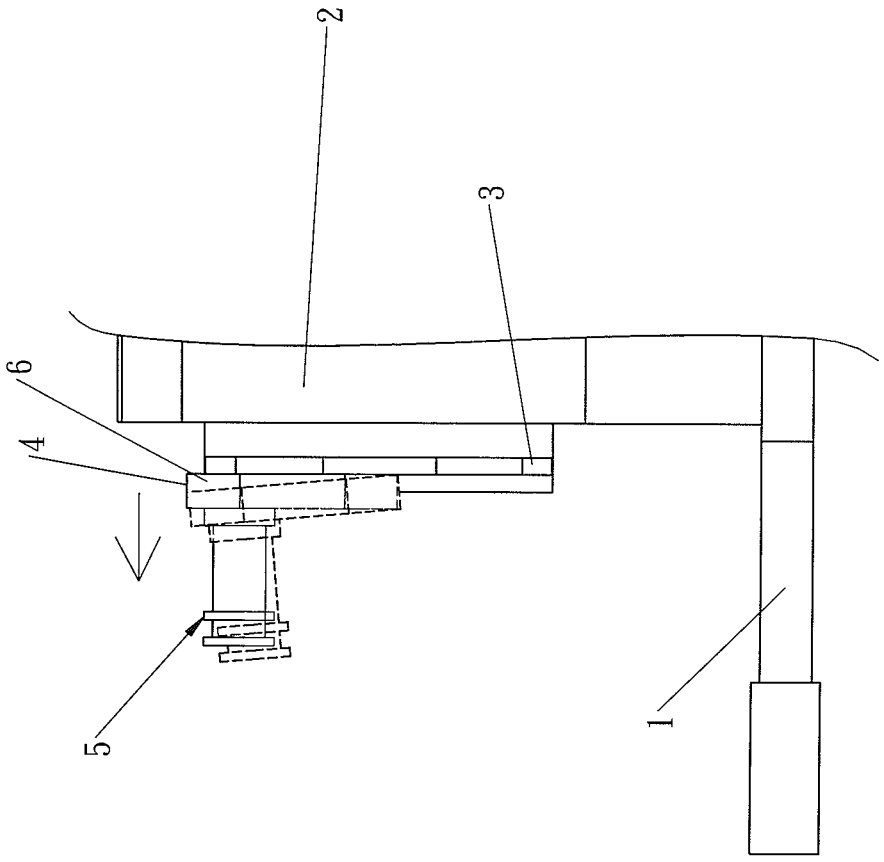


FIG. 2
PRIOR ART

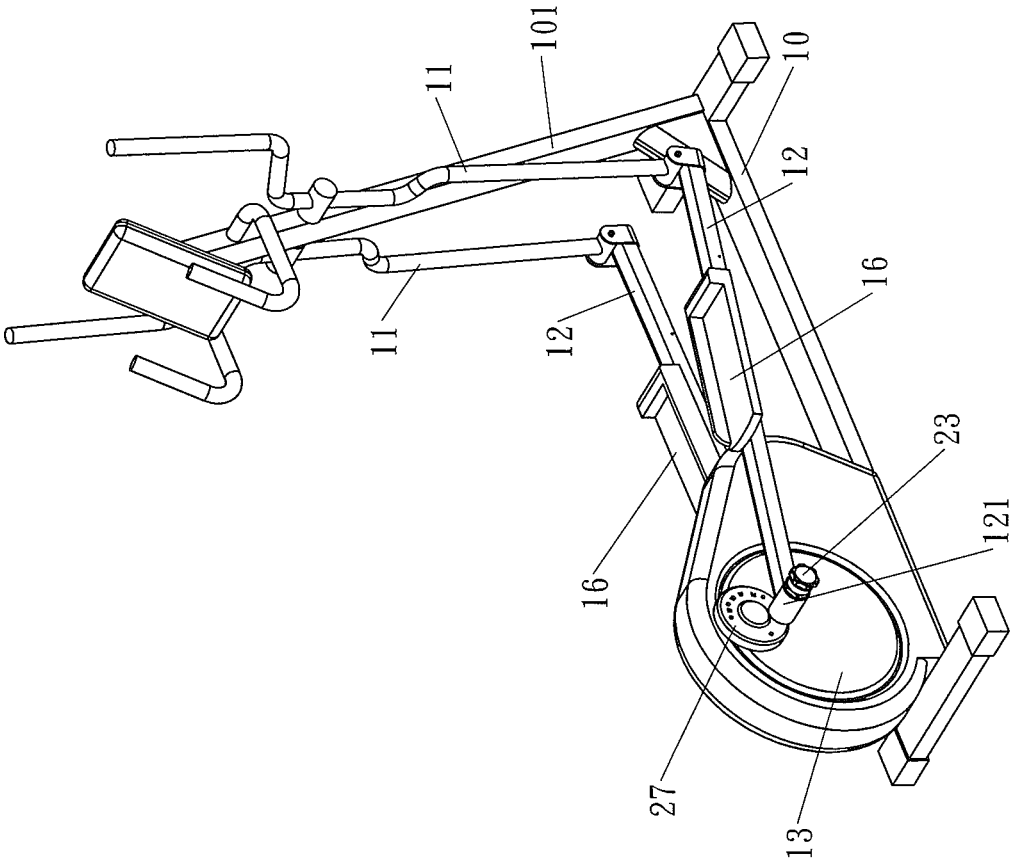


FIG. 3

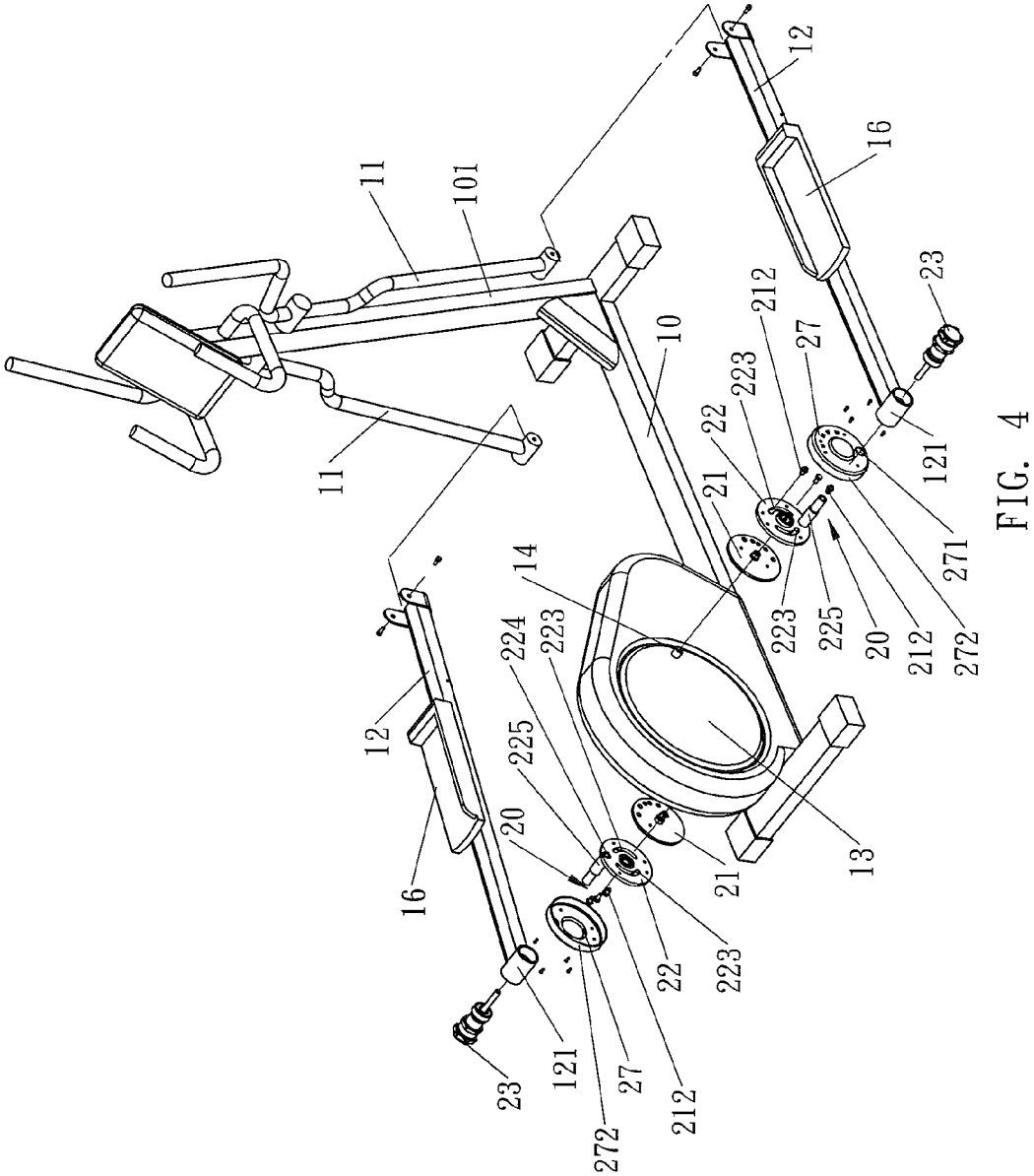

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FIG. 4

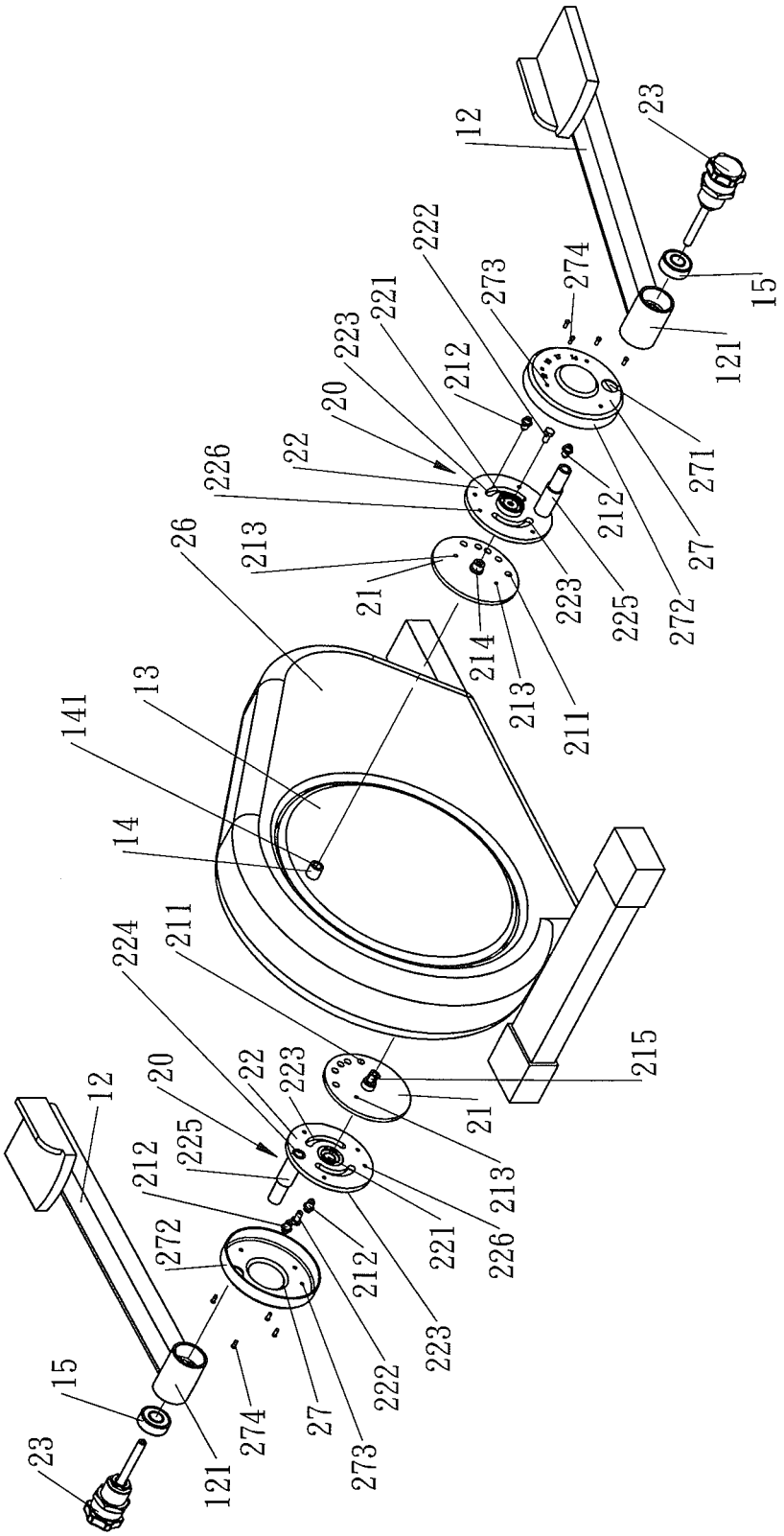
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FIG. 5

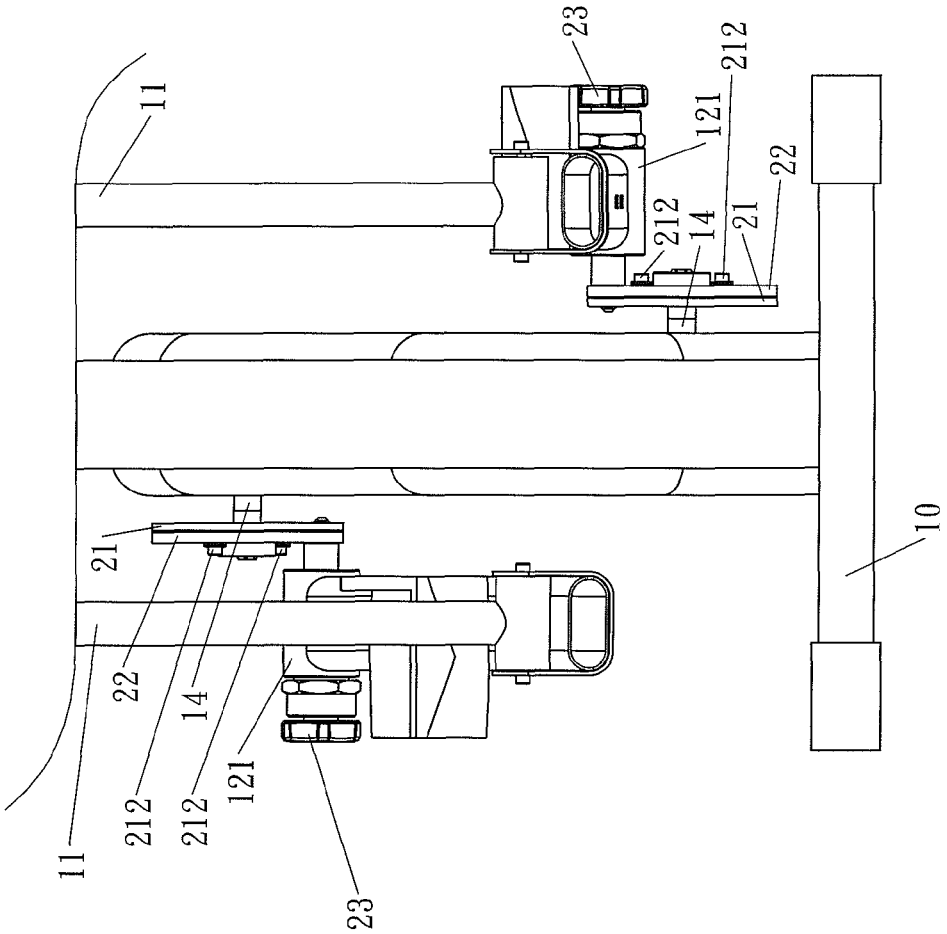

FIG. 6

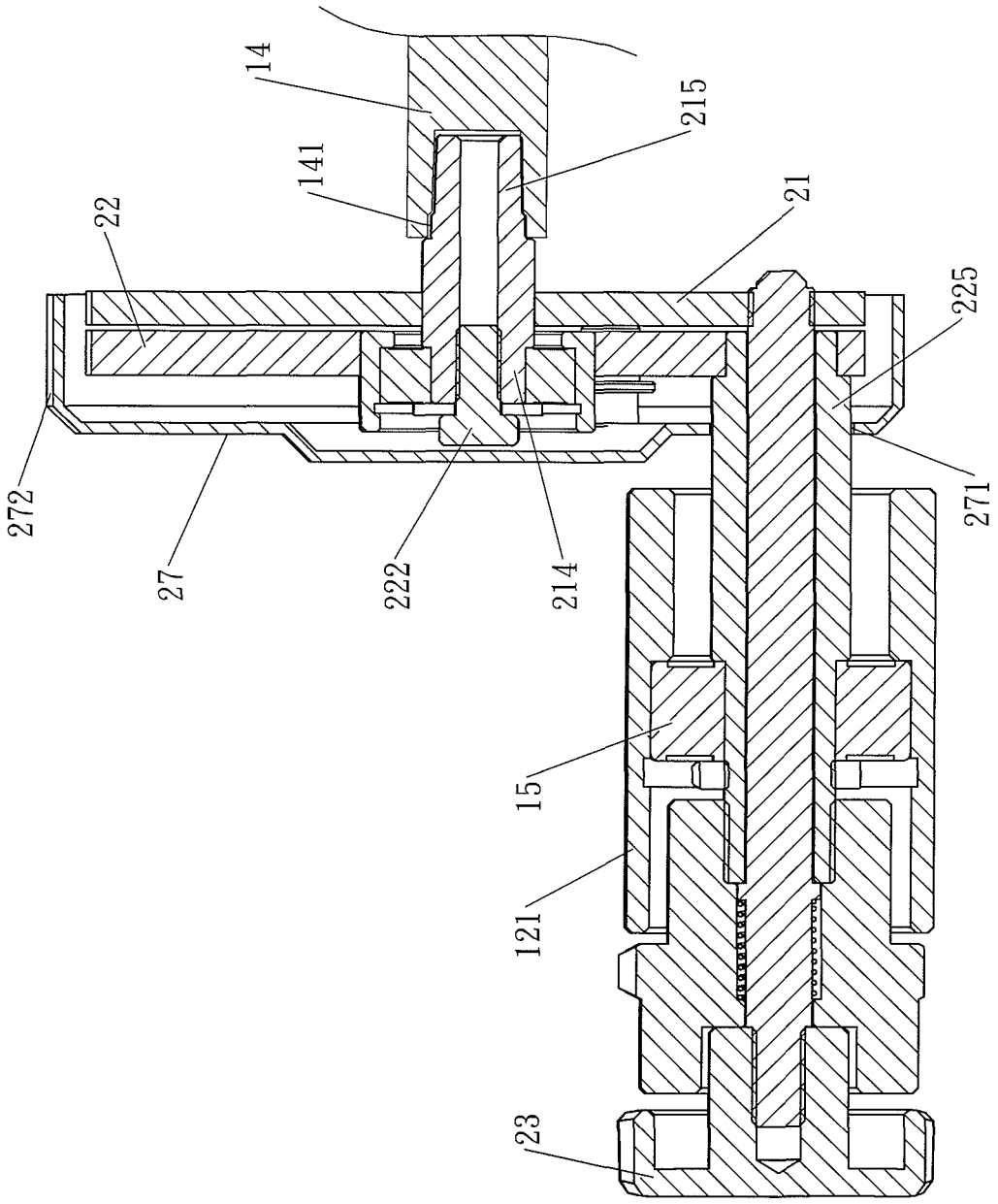

FIG. 7

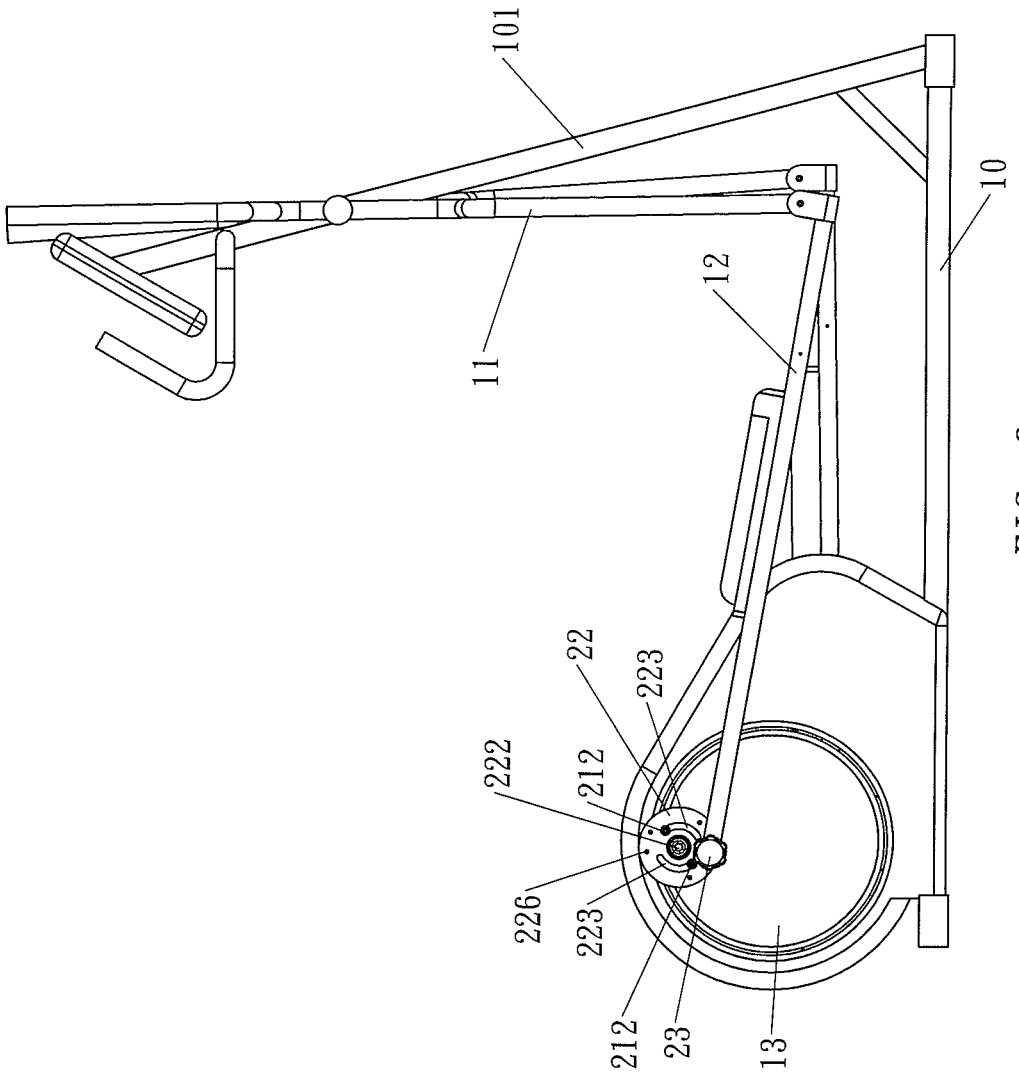

FIG. 8

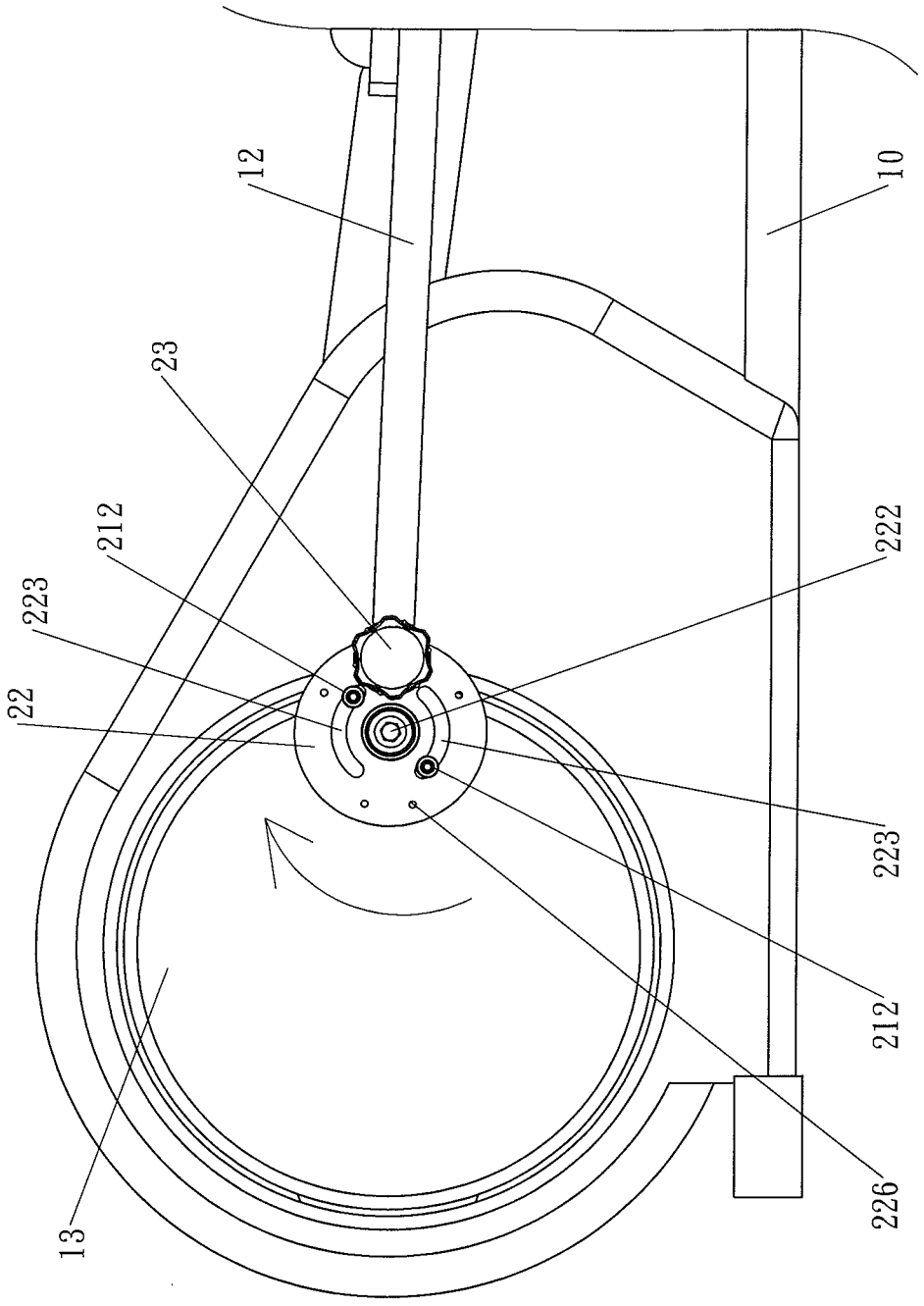

FIG. 9

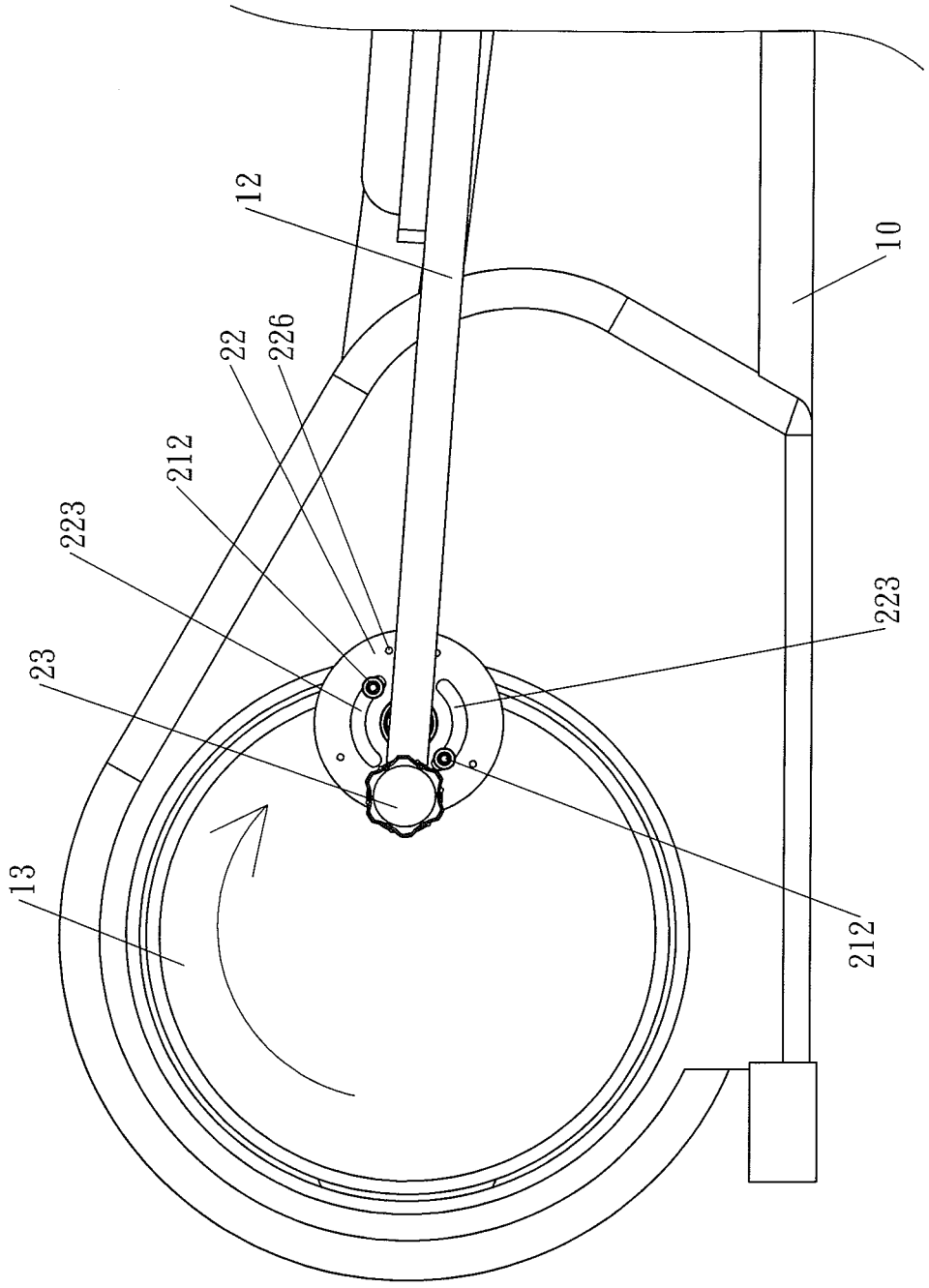

FIG. 10

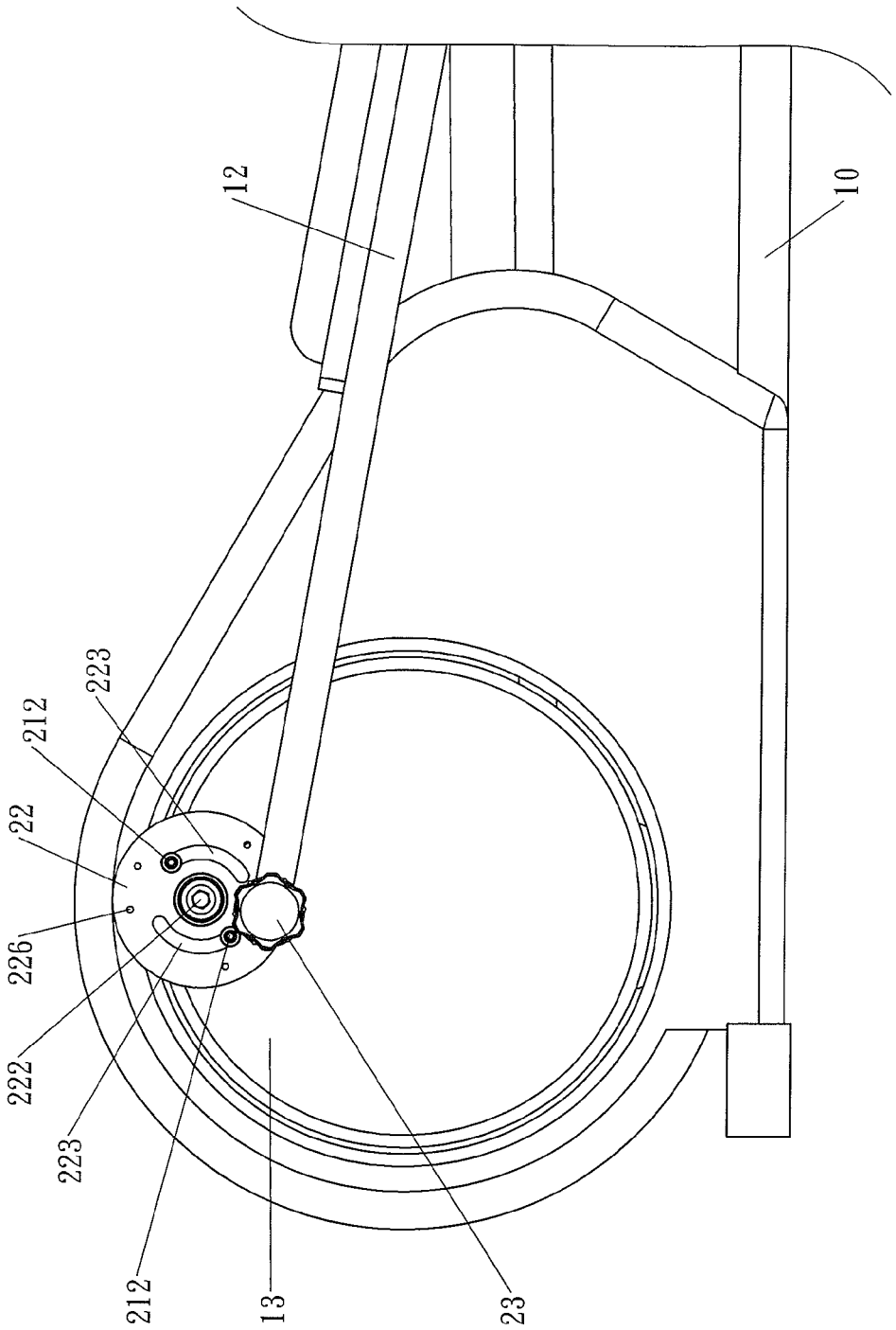

FIG. 11

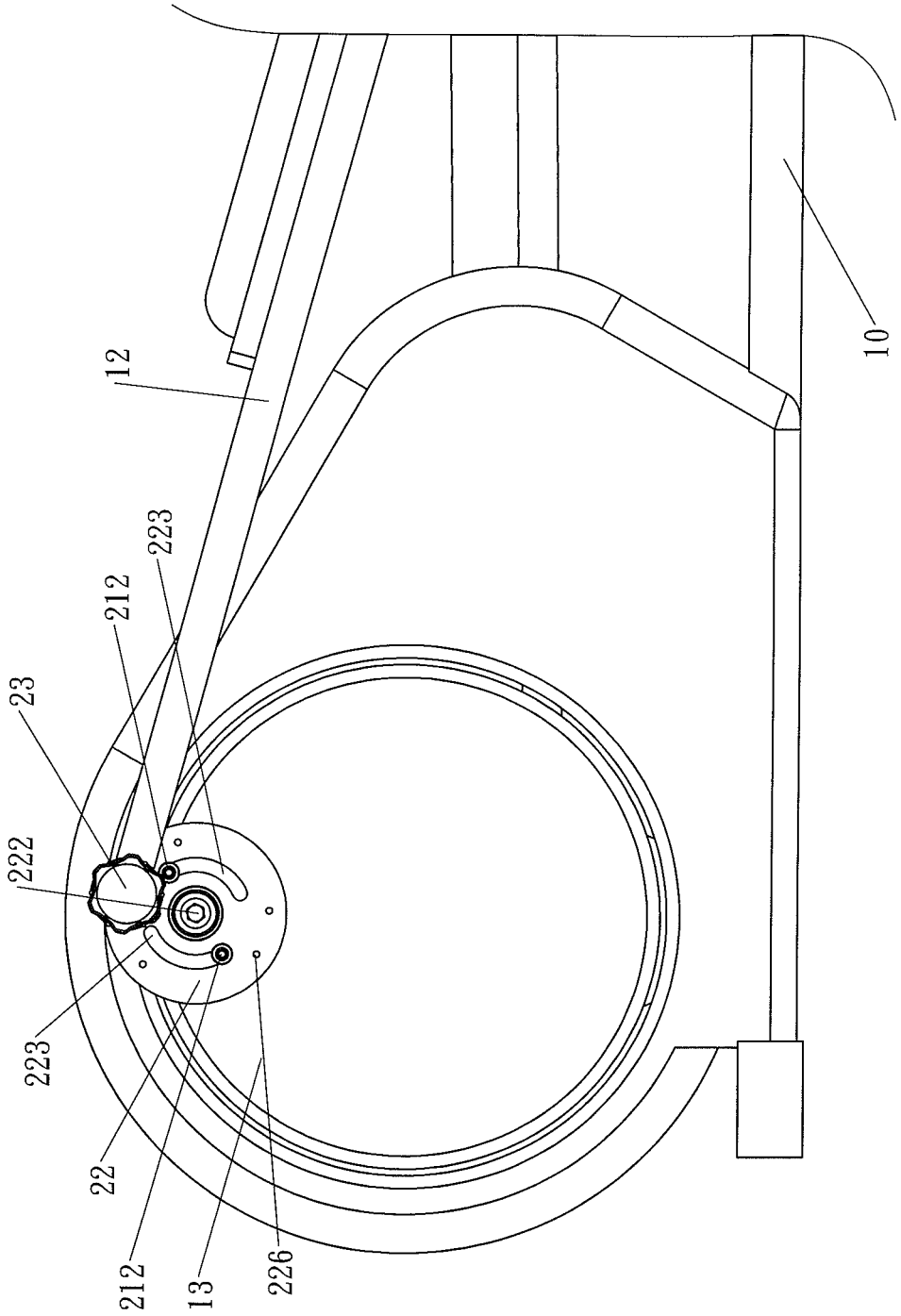

FIG. 12

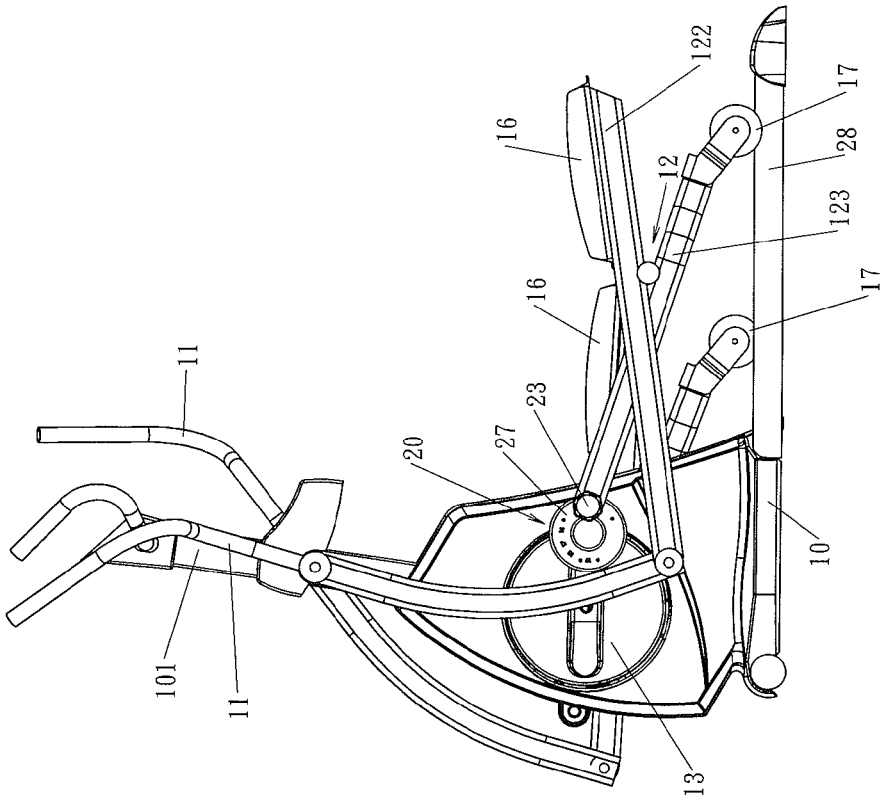

FIG. 13

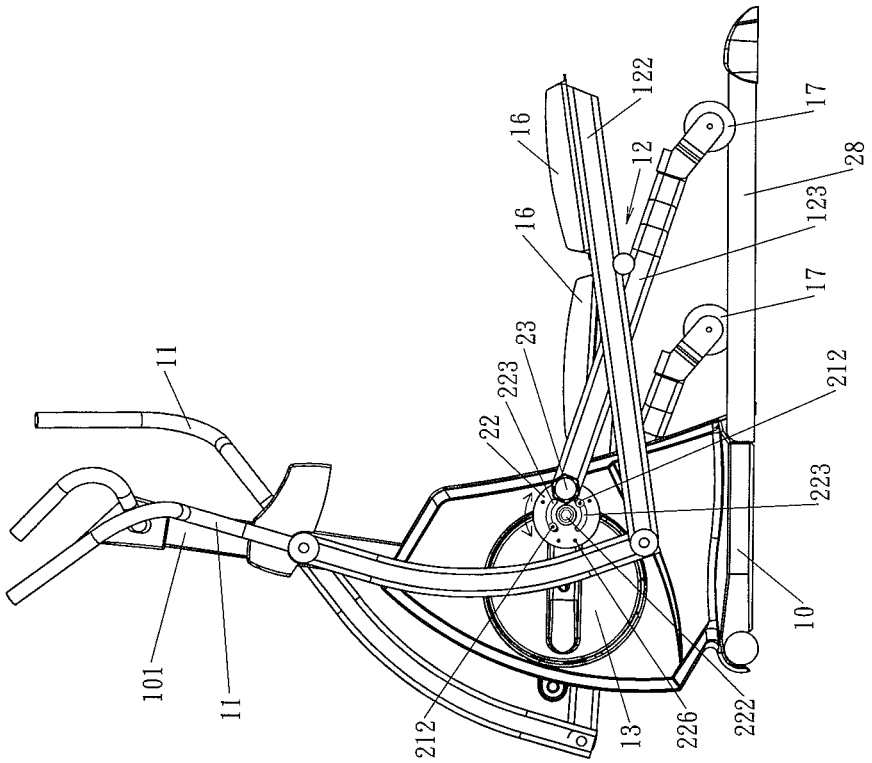
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FIG. 14

ADJUSTING STRUCTURE OF ELLIPTICAL TRAINER

FIELD OF THE INVENTION

The present invention relates to an adjusting structure of an elliptical trainer which adjusts a desired moving track easily and prolongs a service life.

BACKGROUND OF THE INVENTION

Referring to FIGS. **1** and **2**, a conventional adjusting structure of an elliptical trainer contains a base **1**, and the base **1** includes a rotating device **2** disposed on a rear end thereof, two connecting pieces **3** mounted on two angular positions of two side surfaces thereof, wherein each connecting piece **3** has a plurality of orifices **31** defined thereon and an adjuster **4** fixed on one end thereof, and a pull pin **5** is secured on one end of the adjuster **4** and is in connection with each of two driving rods, such that the adjuster **4** is rotated, and the pull pin **5** is inserted into one of the plurality of orifices **31**, thus adjusting a desired moving track of the elliptical trainer.

However, the conventional adjusting structure still has the following defects:

(1). A connecting length of each connecting piece **3**, the adjuster **4**, and the pull pin **5** is too long to operate smoothly, thus damaging each connecting piece **3**, the adjuster **4**, and the pull pin **5** easily.

(2). Each connecting piece **3** and the adjuster **4** are not shielded, so dusts will fall into a gap **6** between each connecting piece **3** and the adjuster **4**.

The present invention has arisen to mitigate and/or obviate the afore-described disadvantages.

SUMMARY OF THE INVENTION

The primary object of the present invention is to provide an adjusting structure of an elliptical trainer which adjusts a desired moving track easily and prolongs a service life.

To obtain above object, an adjusting structure of an elliptical trainer provided by the present invention contains: a base including an upright column disposed a front end thereof, two rotatable posts rotatably connected with two sides of an upper end of the upright column, two driving rods rotatably coupled with two lower ends of the two rotatable posts, a rotating device mounted on a rear end of the base, and two shafts fixed on a first eccentric position and a second eccentric position of two side surfaces of the rotating device.

Each shaft is in connection with an adjuster, and the adjuster has a fixing disc, an adjustment disc with a first side surface coupled with the fixing disc, and a positioning element. The fixing disc has a plurality of first orifices defined thereon and a plurality of limiting stems connected with each shaft, the adjustment disc has two opposite arcuate slots formed thereon, such that when the adjustment disc rotates relative to the fixing disc, the plurality of limiting stems slide in each arcuate slot of the adjustment disc, the adjustment disc also has a first hole defined on an eccentric position thereof, a hollow tube extending outwardly from one side of the first hole, the positioning element is inserted into one of the plurality of first orifices via the hollow tube and the first hole, a hollow fitting sleeve is fitted with the hollow tube, and the hollow fitting sleeve is fitted with a rear end of each driving rod.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a conventional adjusting structure of an elliptical trainer.

FIG. **2** is a side plan view of the conventional adjusting structure of the elliptical trainer.

FIG. **3** is a perspective view showing the assembly of an adjusting structure of an elliptical trainer according to a first embodiment of the present invention.

FIG. **4** is a perspective view showing the exploded components of the adjusting structure of the elliptical trainer according to the first embodiment of the present invention.

FIG. **5** is a perspective view showing the exploded components of a part of the adjusting structure of the elliptical trainer according to the first embodiment of the present invention.

FIG. **6** is a side plan view showing the assembly of a part of the adjusting structure of the elliptical trainer according to the first embodiment of the present invention.

FIG. **7** is a cross sectional view showing the assembly of a part of the adjusting structure of the elliptical trainer according to the first embodiment of the present invention.

FIG. **8** is a side plan view showing the assembly of the adjusting structure of the elliptical trainer according to the first embodiment of the present invention.

FIG. **9** is a side plan view showing the operation of a part of the adjusting structure of the elliptical trainer according to the first embodiment of the present invention.

FIG. **10** is another side plan view showing the operation of a part of the adjusting structure of the elliptical trainer according to the first embodiment of the present invention.

FIG. **11** is also another side plan view showing the operation of a part of the adjusting structure of the elliptical trainer according to the first embodiment of the present invention.

FIG. **12** is still another side plan view showing the operation of a part of the adjusting structure of the elliptical trainer according to the first embodiment of the present invention.

FIG. **13** is a side plan view showing the assembly of an adjusting structure of an elliptical trainer according to a second embodiment of the present invention.

FIG. **14** is another side plan view showing the assembly of the adjusting structure of the elliptical trainer according to the second embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to FIGS. **3** to **7**, an adjusting structure of an elliptical trainer is employed to drive a rear flywheel of the elliptical trainer in according to a first embodiment of the present invention and comprises: a base **10** including an upright column **101** disposed a front end thereof, two rotatable posts **11** rotatably connected with two sides of an upper end of the upright column **101**, two driving rods **12** rotatably coupled with two lower ends of the two rotatable posts **11**, wherein each driving rod **12** has a pedal **16** mounted thereon. The adjusting structure further comprises a rotating device **13** mounted on a rear end of the base **10**, two shafts **14** fixed on a first eccentric position and a second eccentric position of two side surfaces of the rotating device **13**, wherein each shaft **14** is in connection with an adjuster **20**, and the adjuster **20** has a fixing disc **21**, an adjustment disc **22** with a first side surface coupled with the fixing disc **21**, and a positioning element **23**. The fixing disc **21** and the adjustment disc **22** are circular, and a size of the fixing disc **21** is equal to that of the adjustment disc **22**. The fixing disc **21** has a plurality of first orifices **211** defined thereon and a plurality of limiting stems **212** connected with each shaft **14**. The adjustment disc **22** has two opposite arcuate slots **223**

formed thereon, such that when the adjustment disc **22** rotates relative to the fixing disc **21**, the plurality of limiting stems **212** slide in each arcuate slot **223** of the adjustment disc **22**. The adjustment disc **22** also has a first hole **224** defined on an eccentric position thereof, a hollow tube **225** extending outwardly from one side of the first hole **224**. The positioning element **23** is a pull pin for inserting into one of the plurality of first orifices **211** via the hollow tube **225** and the first hole **224**, a hollow fitting sleeve **121** is fitted with the hollow tube **225**, a bearing **15** is fixed between the hollow fitting sleeve **121** and the hollow tube **225**, and the hollow fitting sleeve **121** is fitted with a rear end of each driving rod **12**, such that the adjuster **20** is rotated easily and quickly to adjust a moving track, and a rotation of the rotating device **13** relative to the two driving rods **12** is smooth.

Referring further to FIGS. **5** to **12**, each shaft **14** has an aperture **141** formed on an end portion thereof, and the fixing disc **21** also has a first peg **215** extending outwardly from a central position of a first side surface thereof, such that the first peg **215** is inserted into the aperture **141** to position the fixing disc **21** on each shaft **14**.

The fixing disc **21** further has a plurality of second orifices **213** formed thereon to fit with the plurality of limiting stems **212**.

The fixing disc **21** further has a second peg **214** extending outwardly from a central position of a second side surface thereof, and the adjustment disc **22** further has a pore **221** defined on a central position thereof to fit with the second peg **214**, such that the adjustment disc **22** is connected with the fixing disc **21**. Preferably, the first peg **215** and the second peg **214** are one piece formed and are weld on the fixing disc **21**.

The adjustment disc **22** further has a protective cover **27** coupled with a second side surface thereof, and the protective cover **27** has an eccentric opening **271** for inserting the hollow tube **225**. The protective cover **27** also has a plurality of through openings **273** and a peripheral rib **272** extending outwardly around a peripheral side of one side surface thereof, wherein the peripheral rib **272** shields the adjustment disc **22** and the fixing disc **21**, and the adjustment disc **22** further has a plurality of second holes **226** arranged thereon and corresponding to the plurality of through openings **273** of the protective cover **27**, such that a plurality of screws **274** are screwed with the plurality of second holes **226** via the plurality of through openings **273**.

With reference to FIGS. **13** to **14**, an adjusting structure of an elliptical trainer is employed to drive a front flywheel of the elliptical trainer in according to a second embodiment of the present invention. A difference of the adjusting structure of the second embodiment from that of the first embodiment comprises: a rotating device **13** mounted on a front end of a base **10**; the base **10** including a guiding rail **28** disposed on a rear end thereof, and each of two driving rods **12** having a main extension **122** and an auxiliary extension **123**, wherein a middle section of the main extension **122** is connected with a middle section of the auxiliary extension **123**, and a front end of the main extension **122** is rotatably coupled with a lower end of each rotatable post **11**, the main extension **122** has a pedal **16** disposed on the middle section thereof, and a front end of the auxiliary extension **123** is fitted with the hollow fitting sleeve **121**, a rear end of the auxiliary stem **123** is rotatably connected with a roller **17** for rolling forward and backward on the guiding rail **28**, such that the adjuster **20** is fixed between each shaft **14** and the hollow fitting sleeve **121**. Since a structure and a movement of the adjuster **20** of the second embodiment are identical to those of the first embodiment, its further remarks are omitted.

As shown in FIGS. **3** to **14**, in operation, the positioning element **23** is removed from the hollow tube **225**, the hollow fitting sleeve **121**, and the one of the plurality of first orifices **211**; the adjustment disc **22** is rotated (in the meantime, the protective cover **27** rotates with the adjustment disc **22**), and the plurality of limiting stems **212** slide in each arcuate slot **223** of the adjustment disc **22**, thereafter the positioning element **23** of the adjuster **20** is inserted into another of the plurality of first orifices **211**, thus adjusting the moving track.

Accordingly, the adjusting structure of the elliptical trainer has advantages as follows:

(1). The adjustment disc **22** is coupled with the fixing disc **21**, and the plurality of limiting stems **212** slide in each arcuate slot **223** of the adjustment disc **22**, hence when the elliptical trainer runs in an elliptical movement, and the rotating device **13** rotates, the fixing disc **21** and the adjustment disc **22** are securely coupled together, thus prolonging a service life of the adjuster **20**.

(2). The peripheral rib **272** of the protective cover **27** shields the adjustment disc **22** and the fixing disc **21**, such that dusts will not fall into a first gap **29** between the rotating device **13** and the fixing disc **21**, and the dusts will not enter into a second gap **30** defined between the adjustment disc **22** and the fixing disc **21**, thus the rotation of the rotating device **13** relative to the adjuster **20** is smooth. Preferably, the protective cover **27** shields the adjustment disc **22** and the fixing disc **21** to enhance aesthetics appearance.

(3) The hollow tube **225**, the hollow fitting sleeve **121**, and the positioning element **23** are coaxially connected together, the hollow fitting sleeve **121** is held by user's one hand, and the positioning element **23** (i.e., the pull pin) is pulled by user's the other hand, thereafter the adjustment disc **22** is adjustably rotated, the positioning element **23** (i.e., the pull pin) is inserted into another of the plurality of first orifices **211**, thereby adjusting the moving track quickly and easily.

While we have shown and described various embodiments in accordance with the present invention, it is clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. An adjusting structure of an elliptical trainer comprising: a base including an upright column disposed at a front end of the base, two rotatable posts rotatably connected with two sides of an upper end of the upright column, two driving rods rotatably coupled with two lower ends of the two rotatable posts, a rotating device mounted on a rear end of the base, and two shafts fixed on a first eccentric position and a second eccentric position of two side surfaces of the rotating device; wherein

each shaft is in connection with an adjuster, and the adjuster has a fixing disc, an adjustment disc with a first side surface coupled with the fixing disc, and a positioning element; the fixing disc has a plurality of first orifices defined thereon and a plurality of limiting stems connected with each shaft, the adjustment disc has two opposite arcuate slots formed thereon, such that when the adjustment disc rotates relative to the fixing disc, the plurality of limiting stems slide in each arcuate slot of the adjustment disc, the adjustment disc also has a first hole defined on an eccentric position thereof, a hollow tube extending outwardly from one side of the first hole, the positioning element is inserted

into one of the plurality of first orifices via the hollow tube and the first hole, a hollow fitting sleeve is fitted with the hollow tube, and the hollow fitting sleeve is fitted with a rear end of each driving rod.

2. The adjusting structure of the elliptical trainer as claimed in claim **1**, wherein the fixing disc and the adjustment disc are circular, and a size of the fixing disc is equal to that of the adjustment disc.

3. The adjusting structure of the elliptical trainer as claimed in claim **1**, wherein each shaft has an aperture formed on an end portion thereof, and the fixing disc also has a first peg extending outwardly from a central position of a first side surface thereof, such that the first peg is inserted into the aperture to position the fixing disc on each shaft.

4. The adjusting structure of the elliptical trainer as claimed in claim **1**, wherein the fixing disc further has a plurality of second orifices formed thereon to fit with the plurality of limiting stems.

5. The adjusting structure of the elliptical trainer as claimed in claim **1**, wherein the fixing disc further has a second peg extending outwardly from a central position of a second side surface thereof, and the adjustment disc further has a pore defined on a central position thereof to fit with the second peg, such that the adjustment disc is connected with the fixing disc.

6. The adjusting structure of the elliptical trainer as claimed in claim **1**, wherein the adjustment disc further has a protective cover coupled with a second side surface thereof, and the protective cover has an eccentric opening for inserting the hollow tube, the protective cover also has a peripheral rib extending outwardly around a peripheral side of one side surface thereof to shield the adjustment disc and the fixing disc.

7. The adjusting structure of the elliptical trainer as claimed in claim **1**, wherein the positioning element is a pull pin.

8. The adjusting structure of the elliptical trainer as claimed in claim **1**, wherein when the hollow fitting sleeve is fitted with the hollow tube, a bearing is fixed between the hollow fitting sleeve and the hollow tube.

9. The adjusting structure of the elliptical trainer as claimed in claim **1**, wherein each driving rod has a main extension and an auxiliary extension, a middle section of the main extension is connected with a middle section of the auxiliary extension, and a front end of the main extension is rotatably coupled with a lower end of each rotatable post, the main extension has a pedal disposed on the middle section thereof, and a front end of the auxiliary extension is fitted with the hollow fitting sleeve, a rear end of the auxiliary stem is rotatably connected with a roller.

* * * * *